Beach Monitoring Data User Guide

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Table of Contents

1 Introduction 1-1

1.1 Reference Materials 1-1

2 How To Submit Data 2-1

2.1 Submit Data Via STORET 2-1

2.2 Submit Data Via CDX 2-2

3 How to Prepare Data 3-1

3.1 Elements in flat Files 3-1

3.2 Elements in the XML Schema and XML Files 3-2

3.2.1 Header Information 3-2

3.2.2 Organization Information 3-3

3.2.3 Trip Information 3-4

3.2.4 Station Visit Information 3-5

3.2.5 Field Activity Information 3-6

3.2.6 Result Information 3-12

3.2.7 Laboratory Information 3-17

4 Appendix A Schema Graphics 4-1

5 Appendix B Example Complete XML File 5-7

6 Appendix C Example Minimum XML File 6-1

List of Exhibits

Exhibit 2-2 XML Data Transfer Diagram via CDX and WebSIM 2-4
Exhibit 2-3 flat File Data Transfer Diagram via CDX and WebSIM 2-5
Exhibit 4-1 Header Detail 4-1
Exhibit 4-2 STORET Organization Identifier 4-2
Exhibit 4-3 Trip Detail 4-2
Exhibit 4-4 Station Visit Detail 4-2
Exhibit 4-5 Field Activity Detail 4-3
Exhibit 4-6 Result Detail 4-4
Exhibit 4-7 Laboratory Detail 4-5
Exhibit 4-8 Field Activities Results Submission 4-6
Exhibit 5-1 Sample Complete XML File 5-7
Exhibit 6-1 Sample Minimum XML File 6-1

1 Introduction

The purpose of this document is to introduce representatives from state beach programs to the STOrage and RETrieval (STORET) database. All state beach program monitoring data will be stored in STORET. In particular, this guide is intended for officials from State beach programs and any database administrators (DBAs) in charge of the various state databases.

This document explains beach data submissions to EPA using STORET via a flat file or using EPA's Central Data eXchange (CDX) via either a flat file or an XML file:

- How To Submit Data—an explanation of how data is transferred from the originator (in most cases State Beach programs) to the EPA. User's have two transmission options: data can be transferred through either local versions of the STORET application or through CDX:
  - Transmission using STORET occurs via a flat file and utilizes existing local STORET architecture. Submission using this method is described in Chapter 2.1.
  - Transmission using CDX occurs via either flat file or XML file and utilizes the WebSIM architecture. Submission using this method is described in Chapter 2.2.
- How to Prepare Data—an explanation of the name, characteristics, and descriptions of the various data elements in the data submission. Each section of the XML schema is explained in detail in Chapter 3.2. The traits and qualities of the data in this chapter also apply to data elements contained in flat file submissions.

1.1 Reference Materials

The *Beach Monitoring Data User Guide* uses text and refers to terms and concepts described in other EPA documents. When reading this guide, you may want to review the following related materials for more information:

- STORET Version 2.0 Data Entry Module User Guide (can be downloaded at ftp://ftp.epa.gov/storet/)
- Data Structure List with definitions (can be downloaded at ftp://ftp.epa.gov/storet/)
- STORET Homepage on the Internet—Accessible from the EPA Office of Water homepage, the STORET homepage is the source of the latest information about STORET. You will find documents and articles of interest to the monitoring public at large. The homepage will also be the source of system updates (can be found at http://www.epa.gov/STORET/).

2 How To Submit Data

States submitting monitoring data to EPA can use either flat files via STORET or they can use XML files and flat files via EPA's Central Data eXchange (CDX).

The following steps must be followed by submitting states, regardless of the submission method utilized:

- Contact EPA to attain a list of valid Beach Identifiers for your state
- Register user information with CDX.
- Register methods, stations, projects, and organization information using existing STORET registration pages The STORET Web Registration User Guide will be made readily available at www.epa.gov/CDX or via the beaches web page as soon as possible.
- Submit XML or flat files as described in this document (for an example of a minimum submission with no extra parameters, please see Appendix C).

2.1 Submit Data Via STORET

Data submission via STORET utilizes the decentralized nature of the STORET database. Each STORET user has access to a customized and local copy of the STORET database, within which only their own data resides, and over which they exercise complete control. The STORET software, designed to make local manipulation of this date manageable for the user, is installed on top of each user's customized database.

Submitting data via this local copy of STORET to the master STORET database occurs via an upload of data produced using the "EXPORT DUMP" utility as supplied in the Oracle™ product. This STORET Data Entry Module software noted above will only allow data submission while attached to a specific client-controlled STORET database (either on your PC or on an Oracle™ server you control). Files created in this way are then electronically shipped to EPA. From these files, STORET database administrators (DBAs) can take the submitted data and merge it into the master version of STORET. Uploads of client data to the master version of STORET are performed at intervals determined by the end users, taking into account any administrative requirements imposed by EPA through its business relationships with the client organizations.

2.2 Submit Data Via CDX

The Central Data eXchange (CDX) is an Office of Environmental Information (OEI) initiative to provide a single point of entry for incoming data into EPA. CDX will maintain a set of web pages where, once registered, States can log in and upload data files to EPA.

The following table notes the six steps involved in the submission of data from a State database to EPA's STORET database via CDX and WebSIM. Submitting states need to follow this process in order to submit data via CDX. Exhibits 2-2 and 2-3 show this process in graphic form.

State Steps	CDX Automated Steps	WebSIM Automated Steps
1. Register with CDX via CDX's registration pages.		
2. Register with STORET via STORET's registration pages.		
3a. Create an XML document containing the appropriate data (see Chapter 3.2 for the data to be included) using a local copy of the schema.		
3b. Create a flat file containing the appropriate data using a local copy of STORET.		
4. Upload the data document from a local State computer to CDX via CDX's web site. If submitting an XML file, proceed to step 5. If submitting a flat file, proceed to step 8.		
	5. Archive the file and validate an XML document against the schema. If errors are found, send a CDX error log to the State user; otherwise, skip to Step 7.	
6. If a CDX error log is received, go back to Step 3 and fix the errors.		
	7. If the document is XML, add the header information. Transfer the data document to STORET's WebSIM application.	

State Steps	CDX Automated Steps	WebSIM Automated Steps
		8. Validate the data in the document against the business rules. If errors are found, create an error log and send it back to CDX; otherwise, skip to Step 11.
	9. If a STORET error log is created, pass it along to the State.	
10. If a STORET error log is received, go back to Step 3 and fix the errors.		
		11. When the data file is received that passes the business rules, parse the data into the database and create a success log.
	12. If a STORET success log is created, pass it along to the State.	

The diagrams on Pages 2-4 and 2-4, Exhibits 2.1 and 2-2, respectively, track the flow of data from State Databases to the Master STORET database via Local State Computers, CDX and WebSIM for both XML and flat file submissions.

Exhibit 2-2 XML Data Transfer Diagram via CDX and WebSIM

Begin on the upper left side, labeled "State Database", and follow the flow of arrows through the "Master STORET Database".

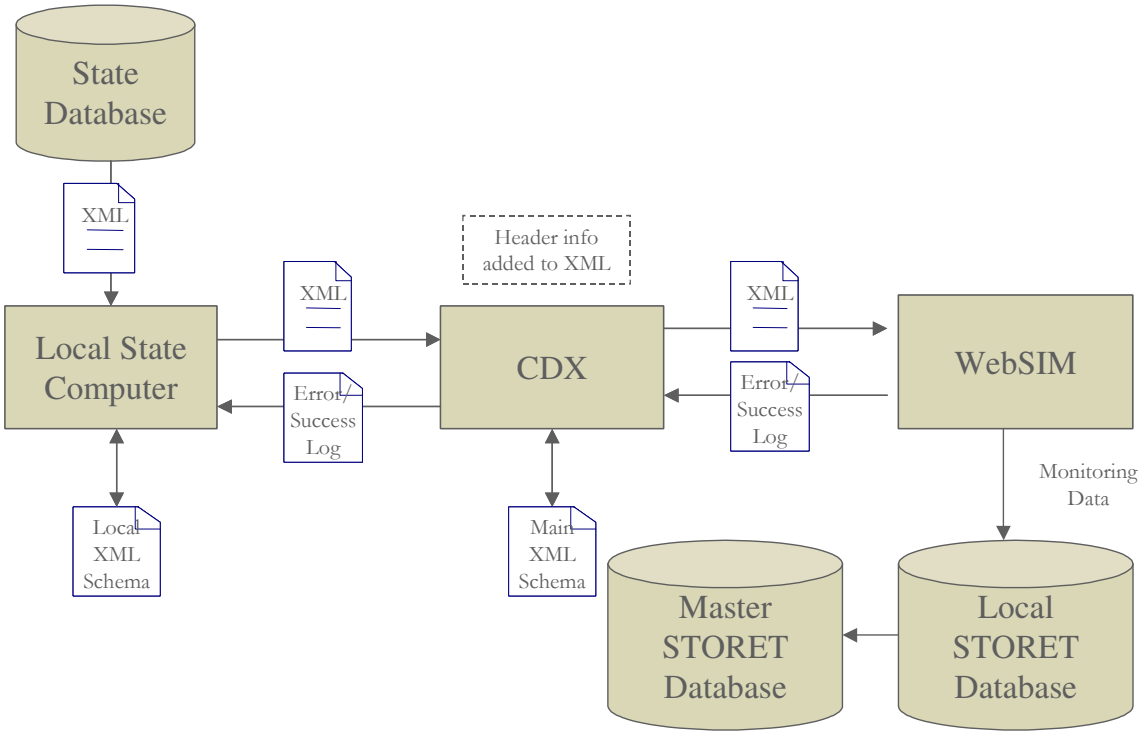
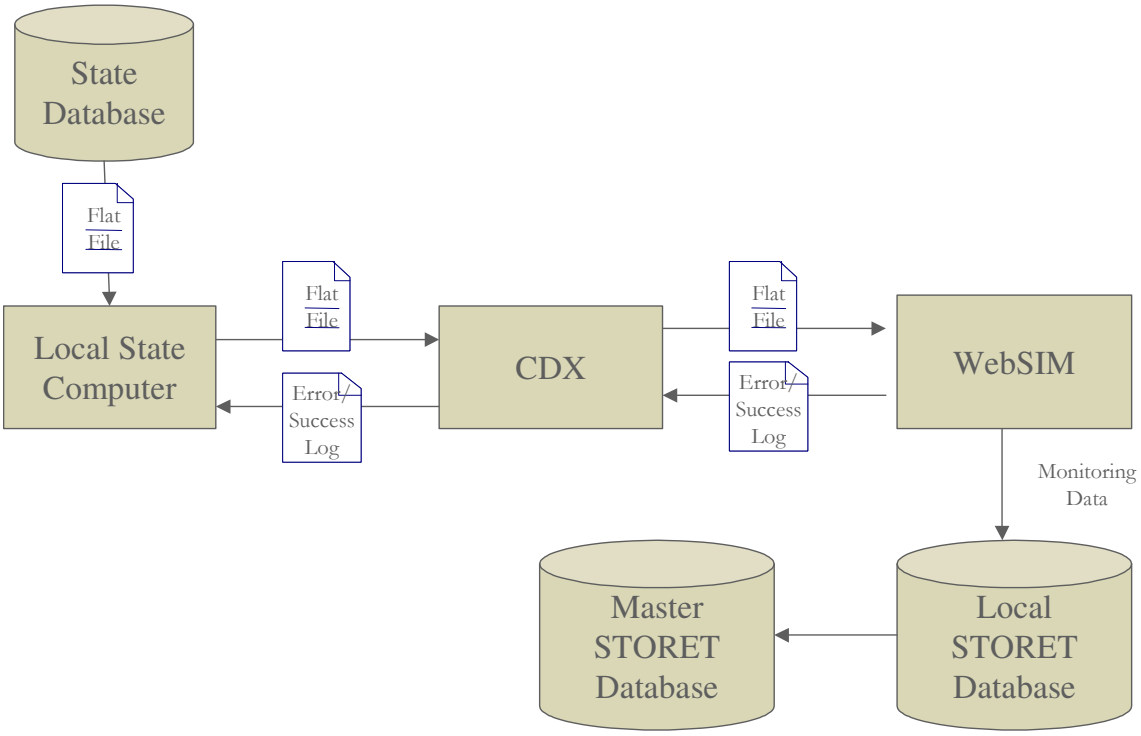


Exhibit 2-3 Flat File Data Transfer Diagram via CDX and WebSIM

Begin on the upper left side, labeled "State Database", and follow the flow of arrows through the "Master STORET Database".



3 How to Prepare Data

This chapter describes the name, characteristics, and descriptions of the various data elements in the data submission.

States submitting monitoring data to EPA can use either flat files via STORET or they can use XML files and flat files via EPA's Central Data eXchange (CDX).

The following steps must be followed by submitting states, regardless of the submission method utilized:

- Contact EPA to attain a list of valid Beach Identifiers for your state
- Register user information with CDX.
- Register methods, stations, projects, and organization information using existing STORET registration pages The STORET Web Registration User Guide will be made readily available at www.epa.gov/CDX or via the beaches web page as soon as possible.
- Submit XML or flat files as described in this document (for an example of a minimum submission with no extra parameters, please see Appendix C).

3.1 Elements in Flat Files

Before states can submit data, they will need to register their methods, stations, projects, and organization information. The STORET Web Registration User Guide will be made readily available at www.epa.gov/CDX or via the beaches web page as soon as possible.

To load your data into STORET using WebSIM, you must first organize your data into delimited text files. Allowed delimiters are Tab, Pipe (|), Tilde(~), or Comma(,). If any of these characters appears in your data, you should NOT use that character as a delimiter since there is no way for WebSIM to tell which is the delimiter and which is simply part of the data. Be sure to not include a header row in the delimited text files that you create.

States submitting data to CDX via flat files can create these delimited text files using common software products such as Excel, Access or Lotus1-2-3. Excel templates that will help you organize your data will be made available shortly.

The same elements that are described in Chapter 3.2 of this document must also be included in flat files (for an example of a minimum submission with no extra parameters, please see Appendix C).

States submitting data to STORET via flat files can use the "EXPORT DUMP" utility as supplied in the Oracle™ product and noted in Chapter 2.1.

3.2 Elements in the XML Schema and XML Files

The XML schema for the data submissions to STORET provides a template for the XML files to be submitted. This schema describes the data elements to be included in the XML document and is used to validate it as well. Files are accepted or rejected based on their conformity to the schema.

A graphical version of this schema is provided in Appendix A and a full example XML document is provided in Appendix B. In addition, a minimum example XML document is provided in Appendix C of this document. Please refer to these appendices when creating an XML document.

Before states can submit data, they will need to register their methods, stations, projects, and organization information. The STORET Web Registration User Guide will be made available at www.epa.gov/CDX or via the beaches web page.

This section contains descriptions of the data elements in the STORET XML Schema. For each table in the following sections, the following information is provided:

- Data Element: The name of the data element stored in the XML data file.
- XML Tag Name: The XML key associated with the data element.
- XML Data Type: The XML data type for this element.
- Length: The maximum length for the data element for character and numeric datatypes.
- Req'd (Y/N): This value indicates if the column is required in the XML data file. Please note that empty tags such as <TripIdentifier></TripIdentifier> or <TripIdentifier/> will not be accepted when the element is not required.
- Comments: Additional comments related to the XML data element.

For questions on the conventions and formats used in the schema, reference the EPA XML Design Rules and Conventions (March 2002).

In addition, if the XML submission passes the validation routine, information about the submission will be inserted into the following four XML tags: SubmissionIdentifier, SubmittingAgencyIdentifier, SubmittingUserIdentifier, and SubmissionDate. These four tags are enclosed in a tag labeled HeaderDetail. The HeaderDetail tag must appear before any other data in the file other than the FieldActivitiesResultsSubmission tag.

3.2.1 Header Information

The header information section of the XML file contains information regarding the data submission, such as submission date, submitting user, and submitting agency. **These keys should not be included in the XML file submitted by the submitting agency.** Instead, once an XML file has been successfully submitted to CDX, these XML keys will be added to the file by the CDX web application.

All XML elements in this section are located in the following position on the XML element hierarchy—"FieldActivitiesResultsSubmission/HeaderDetail/".

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Submitting Agency Identifier *Example: NJDEP*	SubmittingAgencyIdentifier	STRING	Y	12	This key will be inserted into the file by the CDX web application. The list of valid Submitting Agency Identifiers will be maintained as part of the CDX registration process.
Submitting User Identifier *Example: BSMITH*	SubmittingUserIdentifier	STRING	Y	12	This key will be inserted into the file by the CDX web application. The list of valid Submitting User Identifiers will be maintained as part of the CDX registration process.
Submission Identifier *Example: 111111111111*	SubmissionIdentifier	STRING	Y	12	This key will be inserted into the file by the CDX web application. This value will uniquely identify each submission and will be generated by the CDX web application.
Submission Date *Example: 2003-01-0100:00:00*	SubmissionDate	DATE/TIME	Y		This key will be inserted into the file by the CDX web application. The date should be entered in the XML file in the following format: YYYY-MM-DDHH:MI:SS.

3.2.2 Organization Information

The organization information section of the XML submission contains data related to the organization from the submitting State. This data element will always be included in the XML file.

All XML elements in this section are located in the following position on the XML element hierarchy—"FieldActivitiesResultsSubmission".

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
STORET Organization Identifier *Example: 21FLEECO*	STORETOrganizationIdentifier	STRING	Y	8	Submitting organizations will need to obtain this identifier during the STORET registration process. EPA maintains a list of valid Identifiers for all organizations that are registered and stored in the STORET database. These identifiers are unique for each organization, as they will be used to update organization-level data. (For example, within an organization, there can only be one STORET Organization identified as "21FLEECO", but there could be another STORET Organization identified as "21FLEECO" in another organization.)

3.2.3 Trip Information

The trip information section of the XML submission contains data related to the monitoring trip overseen by the submitting State, such as the trip identifier code, start date, and stop date. In the XML schema, multiple trips may be reported. Each trip may include multiple station visits.

All XML elements in this section are located in the following position on the XML element hierarchy—"FieldActivitiesResultsSubmission/TripDetail/".

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Trip Identifier *Example: 21NJBP*	TripIdentifier	STRING	Y	15	Submitting organizations will need to create and maintain a list of valid Trip Identifiers for all trips stored in the STORET database. These identifiers must be unique within each organization, as they will used to create organization-level data. (For example, within an organization, there can only be one trip identified as "21NJBP", but there could be another trip identified as "21NJBP" in another organization.)
Trip Start Date *Example: 2003-01-01*	TripStartDate	DATE	N		The date should be entered in the XML file in the following format: YYYY-MM-DD.

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Trip Stop Date *Example: 2003-01-01*	TripStopDate	DATE	N		The date should be entered in the XML file in the following format: YYYY-MM-DD.
Trip Name *Example: Weekly Sampling*	TripName	STRING	N	60	This is the name that submitting agencies may choose to assign to a Trip.

3.2.4 Station Visit Information

The station visit information section of the XML submission contains data related to a visit to a particular monitoring station for the purpose of collecting field activity information. In the XML schema, multiple station visits are part of a single trip. Each station visit may include multiple field activities.

All XML elements in this section are located in the following position on the XML element hierarchy—"FieldActivitiesResultsSubmission/TripDetail/StationVisitDetail".

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Station Identifier *Example: 095L-3*	StationIdentifier	STRING	Y	15	Submitting organizations will need to register a list of valid Station Identifiers for all stations stored in the STORET database. These identifiers must be unique within each organization, as they will used to create organization-level data. (For example, within an organization, there can only be one station identified as "095L-3", but there could be another station identified as "095L-3" in another organization.)
Visit Identifier *Example: 12*	VisitIdentifier	STRING	Y	3	Submitting organizations will need to create and maintain a list of valid Visit Identifiers for all visits stored in the STORET database. These identifiers must be unique within each organization, as they will used to update organization-level data. (For example, within an organization, there can only be one visit identified as "12", but there could be another visit identified as "12" in another organization.)

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Visit Arrival Date *Example: 2003-01-01*	VisitArrivalDate	DATE	N		The date should be entered in the XML file in the following format: YYYY-MM-DD.
Visit Comment Station Condition Text *Example: Sunny and dogs*	VisitCommentStationConditionText	STRING	N	4000	
Station Visit Binary Large Object Type Code *Example: PDF*	BinaryLargeObjectDetail/BLOBTypeCode	STRING	N	3	A three-letter code that can be used to identify the type of Binary Large Object Type file (i.e. PDF, DOC, JPG). If this element is included in the XML submission, the Binary Large Object Title Text must be included as well.
Station Visit Binary Large Object Title Text *Example: PictureofBeach52.PDF*	BinaryLargeObjectDetail/BLOBTitleText	STRING	N	60	This is the name of the Binary Large Object. If this element is included in the XML submission, the Binary Large Object Type Code must be included as well.

3.2.5 Field Activity Information

The field activity section of the XML submission contains data related to the collection of samples and the creation of results, such as activity identifiers and medium codes. In the XML schema, multiple field activities are part of a single station visit, and each field activity may have many results.

All XML elements in this section are located in the following position on the XML element hierarchy—"FieldActivitiesResultsSubmission/TripDetail/StationVisitDetail/FieldActivityDetail".

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Activity Identifier *Example: 62343B*	ActivityIdentifier	STRING	Y	12	Submitting organizations will need to create and maintain a list of valid Activity Identifiers for all activities stored in the STORET database. These identifiers must be unique within each organization, as they will used to update organization-level data. (For example, within an organization, there can only be one activity identified as "62343B", but there could be another trip identified as "62343B" in another organization.)
Project Identifier *Example: EPABEACH* *Example2: NJ012345*	ProjectIdentifier	STRING	Y	8	States will use the Project Identifier field to report the specific Beach Identifiers that apply to this field activity. The EPA level code 'EPABEACH' as well as the individual Beach Identifiers created during the STORET registration process should be included. Submitting organizations will need to obtain this Beach Identifier during the STORET registration process. EPA maintains a list of valid identifiers for all beaches that are registered and stored in the STORET database. These identifiers are unique for each beach. Along with the Beach Identifiers, an unlimited number of other Project Identifiers created during STORET registration may be included in the XML submission.
Activity QC Indicator *Example: Y*	ActivityQCIndicator	STRING	Y	1	This value must be set to "Y" or "N". If this value is set to "Y", the activity is a QC activity If this value is set to "N", the activity is a monitoring event, not a QC activity.
Activity Category Code *Example: Sample*	ActivityCategoryCode	STRING	Y	30	A description used to distinguish between different kinds of samples, and different kinds of measurements and observations. This code must come from a list of permitted values.

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Activity Medium Code *Example: Water*	ActivityMediumCode	STRING	Y	20	This code refers to the specific media in which an activity is conducted. It must come from a list of permitted values: Air Sediment Water Biological Soil Other.
Sampled Matrix Name *Example: Bob's*	SampledMatrixName	STRING	N	25	The name of the medium or matrix represented by the Field Activity.
Activity Replicate Number Value *Example: 476*	ActivityReplicateNumbeValue	STRING	N	3	This value is required only if the activity category is a "Replicate".
Activity Start Date *Example: 2003-01-01*	ActivityStartDateTimeDetail/Date	DATE	Y		This date is the start date of the activity utilized to obtain the specific sample and not the start date of the entire visit. The date should be entered in the XML file in the following format: YYYY-MM-DD.
Activity Start Time *Example: 10:30:00*	ActivityStartDateTimeDetail/Time Detail/Time	TIME	N		The time should be entered in the XML file in the following format: HH:MI:SS. If this element is included in the XML submission, the Activity Start Time Zone Code must be included as well.

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Activity Start Time Zone Code *Example: EDT*	ActivityStartDateTimeDetail/TimeDetail/TimeZoneCode	STRING	N	3	If the Activity Start Time is included in the XML submission, this element must be included as well and set to one of the following: AST (Atlantic Standard Time) ADT (Atlantic Daylight Savings Time) EST (Eastern Standard Time) EDT (Eastern Daylight Savings Time) CST (Central Standard Time) CDT (Central Daylight Savings Time) MST (Mountain Standard Time) MDT (Mountain Daylight Savings Time) PST (Pacific Standard Time) PMT (Pacific Daylight Savings Time) AK (Alaskan Standard Time) HI (Hawaii Standard Time) GU (Guam Standard Time).
Activity End Date *Example: 2003-01-16*	ActivityEndDateTimeDetail/Date	DATE	N		The date should be entered in the XML file in the following format: YYYY-MM-DD. If an Activity End Date Time Detail is included in the XML submission, the Activity End Date must be included as well.
Activity End Time *Example: 16:12:17*	ActivityEndDateTimeDetail/TimeDetail/Time	TIME	N		The time should be entered in the XML file in the following format: HH:MI:SS. If this element is included in the XML submission, the Activity End Time Zone Code must be included as well.

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Activity End Time Zone Code *Example: EDT*	ActivityEndDateTimeDetail/TimeDetail/TimeZoneCode	STRING	N	3	If the Activity End Time is included in the XML submission, this element must be included as well and set to one of the following: AST (Atlantic Standard Time) ADT (Atlantic Daylight Savings Time) EST (Eastern Standard Time) EDT (Eastern Daylight Savings Time) CST (Central Standard Time) CDT (Central Daylight Savings Time) MST (Mountain Standard Time) MDT (Mountain Daylight Savings Time) PST (Pacific Standard Time) PMT (Pacific Daylight Savings Time) AK (Alaskan Standard Time) HI (Hawaii Standard Time) GU (Guam Standard Time).
Activity Comment Text *Example: Windy*	ActivityCommentText	STRING	N	254	
Sample Collection Procedure Identifier *Example: Standard*	SampleCollectionProcedureIdentifier	STRING	N	10	Submitting organizations will need to obtain this identifier during the STORET registration process. EPA maintains a list of valid Sample Collection Procedure Identifiers for all activities that are registered and stored in the STORET database. These identifiers are unique for each organization, as they will used to update organization-level data. (For example, within an organization, there can only be one Sample Collection Procedure identified as "Standard", but there could be another Sample Collection Procedure identified as "Standard" in another organization.)

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Sample Collection Procedure Comment Text *Example: See the New Jersey Department of Environmental Quality Assurance Program Plan*	SampleCollectionProcedureCommentText	STRING	N	1999	
Sample Transport Storage Identifier *Example: JJ871*	SampleTransportStorageIdentifier	STRING	N	10	Submitting organizations will need to obtain this identifier during the STORET registration process. EPA maintains a list of valid Sample Transport Storage Identifiers for all activities that are registered and stored in the STORET database. These identifiers are unique for each organization, as they will used to update organization-level data. (For example, within an organization, there can only be one Sample Transport Storage identified as "JJ871", but there could be another Sample Transport Storage identified as "JJ871" in another organization.)
Sample Transport Storage Comment Text *Example: No Comment*	SampleTransportStorageCommentText	STRING	N	1999	
Activity Depth Measure *Example: 3*	ActivityDepthMeasure	STRING	Y	8	This field refers to the depth of the substance from which the sample was obtained. This is a numeric stored in textual form.

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Activity Depth Unit Code *Example: ft*	ActivityDepthUnitCode	STRING	Y	3	This code must come from a list of permitted values: If this value is set to "ft", the activity depth measure is in feet. If this value is set to "m", the activity depth measure is in meters. This data element is used in conjunction with the Activity Depth Measure data element.
Relative Depth Indicator Code *Example: Bottom*	RelativeDepthIndicatorCode	STRING	N	15	This field refers to the depth relative to the waterbody from which the sample was obtained. The value must come from a list of permitted values: Bottom Midwater Surface Near Bottom Subbottom.
Depth Measure Reference Point Text *Example: High surf*	DepthMeasureReferencePointText	STRING	N	30	

3.2.6 Result Information

The result section of the XML submission contains data related to the estimated, measured, or calculated values resulting from a field activity. This section includes data elements such as characteristic name and result value. In the XML schema, multiple results are part of a single field activity. Each result may also be associated with a single laboratory detail.

All XML elements in this section are located in the following position on the XML element hierarchy—"FieldActivitiesResultsSubmission/TripDetail/StationVisitDetail/FieldActivityDetail/ResultDetail".

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Characteristic Name *Example:* *Enterococccus*	CharacteristicName	STRING	Y	60	This field refers to the name of the pollutant or stressor measured or computed in the result. If a result is included in the XML submission, the Characteristic Name must be included as well.
Characteristic Result Value Text *Example: 35*	CharacteristicResultValueText	STRING	Y	4000	Either the actual amount measured or calculated in the result in text form, or a text value taken from a short permitted value list, or a detection condition from the following list: Non_detect Present Present <QL Present >QL.
Characteristic Result Value Unit Code *Example:* *cfu/100ml*	CharacteristicResultValueUnitCode	STRING	Y	10	The code that represents the units in which the Characteristic Result is expressed. This code must come from a list of permitted values.

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Characteristic Result Sample Fraction Code *Example: Total*	CharacteristicResultSampleFractionCode	STRING	N	15	The text name of the portion of the sample obtained from physically-partitioned sample. This code must come from a list of permitted values: Total Dissolved Suspended Settleable Non_settleable Filterable Non_filterable Volatile Non_volatile Acid Soluble Vapor Supernate Fixed Total Recovrble Comb Available Total Residual Free Available.

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Characteristic Result Statistic Type Code *Example: Maximum*	CharacteristicResultStatisticTypeCode	STRING	N	18	This field is used to describe the relative amount of the particular pollutant or stressor. This code must come from a list of permitted values: Mean Median Mode Maximum Minimum Standard Deviation MPN (Most Probably No.) 5 pctl (percentile) 10 pctl 15 pctl 20 pctl 25 pctl 75 pctl 80 pctl 85 pctl 90 pctl 95 pctl.
Characteristic Result Value Type Code *Example: Actual*	CharacteristicResultValueTypeCode	STRING	N	10	The field contains data denoting the method of data measurement. This code must come from a list of permitted values: Actual Estimated Calculated.
Characteristic Result Temperature Basis Code *Example: 25 Deg C*	CharacteristicResultTemperatureBasisCode	STRING	N	8	This field denotes the temperature of the result. This code must come from a list of permitted values: 05 Deg C 10 Deg C . . (every 5 Deg) . 90 Deg C 95 Deg C.

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Characteristic Result Duration Basis Code *Example: 1 Day*	CharacteristicResultDurationBasisCode	STRING	N	10	The period of time over which a measurement was made. In some cases, it indicates an analytical procedure that has a prescribed duration, while in other cases it indicates a period of time within which a certain effect or result might occur. This qualifier may also indicate a period of time over which a cumulative or averaged measurement occurs. This code must come from a list of permitted values: 24 Hours 96 Hours 1 Day 3 Day . . (every 1 Day) . 29 Day 30 Day 60 Day 90 Day 120 Day 6 Month 1 Year.
Characteristic Result Weight Basis Code *Example: Wet*	CharacteristicResultWeightBasisCode	STRING	N	12	This field denotes the relative wetness/dryness of a result at the time of measurement. This code must come from a list of permitted values: Wet Dry Ash-Free Dry.
Characteristic Result Comment Text *Example: Not quite wet, yet not quite dry*	CharacteristicResultCommentText	STRING	N	4000	

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Result Binary Large Object Type Code *Example: JPG*	BinaryLargeObjectDetail/BLOBTypeCode	STRING	N	3	A three-letter code that can be used to identify the type of Binary Large Object Type file (i.e. PDF, DOC, JPG). If this element is included in the XML submission, the Result Binary Large Object Title Text must be included as well.
Result Binary Large Object Title Text *Example: Sediment4.JPG*	BinaryLargeObjectDetail/BLOBTitleText	STRING	N	60	This is the name that submitting agencies give to Binary Large Object's. If this element is included in the XML submission, the Binary Large Object Type Code must be included as well.
Characteristic Result Field Lab Analytical Source Acronym *Example: DOH*	CharacteristicResultFieldLabAnalyticalDetail/CharacteristicResultFieldLabAnalyticalSourceAcronym	STRING	N	12	Refers to the type of analytical employed during sample analysis to obtain the results. If this element is included in the XML submission, the Characteristic Result Field Lab Analytical Procedure Identifier must be included as well.
Characteristic Result Field Lab Analytical Procedure Identifier *Example: 87U23*	CharacteristicResultFieldLabAnalyticalDetail/CharacteristicResultFieldLabAnalyticalProcedureIdentifier	STRING	N	15	Refers to the analytical procedure employed during sample analysis to obtain the results. Submitting organizations will need to obtain this identifier during the STORET registration process. EPA maintains a list of valid Characteristic Result Field Lab Analytical Procedure Identifiers that are registered and stored in the STORET database. These identifiers are unique for each organization, as they will used to update organization-level data. (For example, within an organization, there can only be one Characteristic Result Field Lab Analytical Procedure identified as "87U23", but there could be another Characteristic Result Field Lab Analytical Procedure identified as "87U23" in another organization.)

3.2.7 Laboratory Information

The laboratory information section of the XML submission contains data related to the laboratories used by beaches to extract result information. This section includes data elements such as laboratory identifier

and laboratory batch identifier. In the XML schema, laboratory information may be reported for each result.

All XML elements in this section are located in the following position on the XML element hierarchy—"FieldActivitesResultsSubmission/TripDetail/StationVisitDetail/FieldActivityDetail/ResultDetail/LaboratoryDetail/".

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Laboratory Identifier *Example: CC8*	LaboratoryIdentifier	STRING	Y	8	Submitting organizations will need to obtain this identifier during the STORET registration process. EPA maintains a list of valid Laboratory Identifiers for all laboratories that are registered and stored in the STORET database. These identifiers are unique for each organization, as they will used to update organization-level data. (For example, within an organization, there can only be one Laboratory identified as "CC8", but there could be another Laboratory identified as "CC8" in another organization.)
Laboratory Batch Identifier *Example: 98UIXW2*	LaboratoryBatchIdentifier	STRING	N	12	An abbreviation or commonly used name of the laboratory.
Laboratory Certification Indicator *Example: Y*	LaboratoryCertificationIndicator	STRING	N	1	This field indicates whether or not the lab is an EPA certified lab. This value must be set to one of the following: Y If this value is set to "Y", the lab is an EPA certified lab. N If this value is set to "N", the lab is not an EPA certified lab.
Laboratory Analysis Date *Example: 2003-01-01*	LaboratoryAnalysisDateTimeDetail/Date	DATE	N		The date should be entered in the XML file in the following format: YYYY-MM-DD. If a Laboratory Analysis Time Date Detail is included in the XML submission, the Laboratory Analysis Date must be included as well.

Data Element	XML Tag Name	XML Data Type	Req'd (Y/N)	Length	Comment
Laboratory Analysis Time *Example: 00:45:59*	LaboratoryAnalysisDateTimeDetail/TimeDetail/Time	TIME	N		The time should be entered in the XML file in the following format: HH:MI:SS. If this element is included in the XML submission, the Laboratory Analysis Time Zone Code must be included as well.
Laboratory Analysis Time Zone Code *Example: EDT*	LaboratoryAnalysisDateTimeDetail/TimeDetail/TimeZoneCode	STRING	N	3	If the Laboratory Analysis Time is included in the XML submission, this element must be included as well and set to one of the following: AST (Atlantic Standard Time) ADT (Atlantic Daylight Savings Time) EST (Eastern Standard Time) EDT (Eastern Daylight Savings Time) CST (Central Standard Time) CDT (Central Daylight Savings Time) MST (Mountain Standard Time) MDT (Mountain Daylight Savings Time) PST (Pacific Standard Time) PMT (Pacific Daylight Savings Time) AK (Alaskan Standard Time) HI (Hawaii Standard Time) GU (Guam Standard Time).
Laboratory Result Detection Limit Text *Example: 20*	LaboratoryResultDetectionLimitDetail/LaboratoryResultDetectionLimitText	STRING	N	12	The detection limit of the laboratory result. If this element is included in the XML submission, the Laboratory Result Detection Limit Unit Code must be included as well.
Laboratory Result Detection Limit Unit Code *Example: ppm*	LaboratoryResultDetectionLimitDetail/LaboratoryResultDetectionLimitUnitCode	STRING	N	10	This code denotes the units of measure to which the Laboratory Detection Limit Text Refers. This code must come from a list of permitted values. If this element is included in the XML submission, the Laboratory Result Detection Limit Text must be included as well.

4 Appendix A Schema Graphics

This appendix provides a graphical decomposition of the STORET XML Schema. The figures that follow offer an expanded view of each of the seven detail sections that comprise a Field Activities Results Submission (Header Detail, STORET Organization Identifier, Trip Detail, Station Visit Detail, Field Activity Detail, Result Detail, and Laboratory Detail). A figure displaying the full Field Activities Results Submission is also included.

- Dashed lines represented optional elements, solid lines represent mandatory elements.
  - Please note: Empty tags (e.g., <TripIdentifier></TripIdentifier>) for optional elements cannot appear in the XML file.
- The figures 0..∞ and 1.. ∞ mean that the field may be repeated, as long as the repetitions are next to each other, as many times as the user wishes.
  - For example, a user may submit as many TripDetail sections as necessary in a single file.
- A + sign at the end of the box means more elements exist behind that element.

Exhibit 4-1 Header Detail

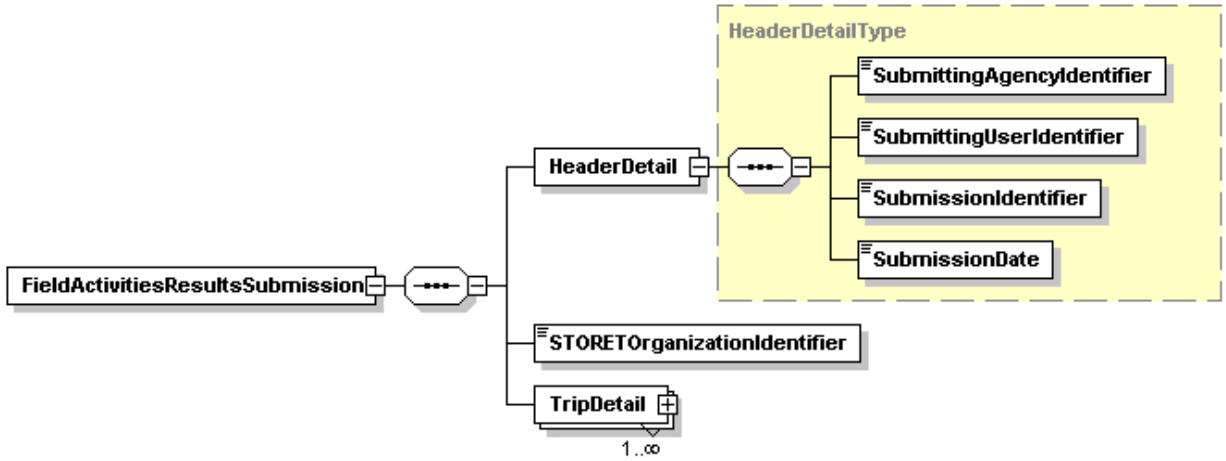


Exhibit 4-2 STORET Organization Identifier

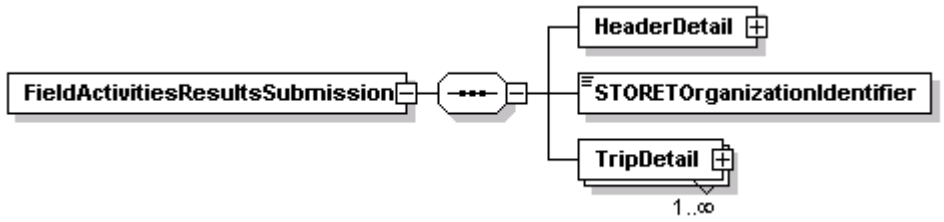


Exhibit 4-3 Trip Detail

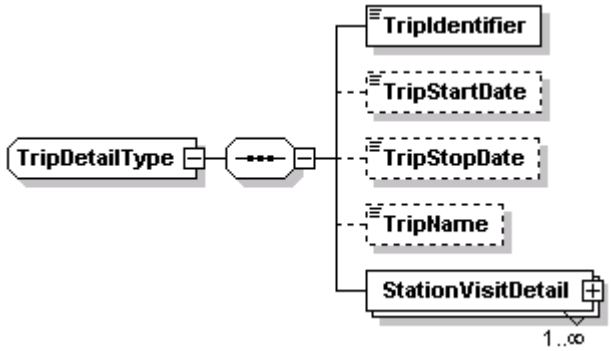


Exhibit 4-4 Station Visit Detail

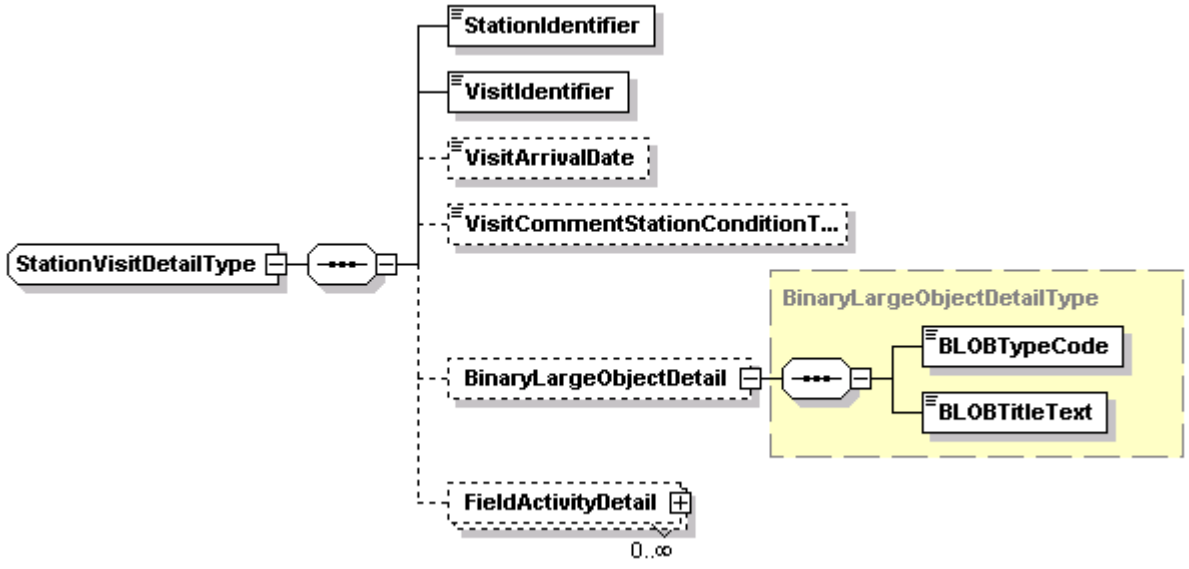


Exhibit 4-5 Field Activity Detail

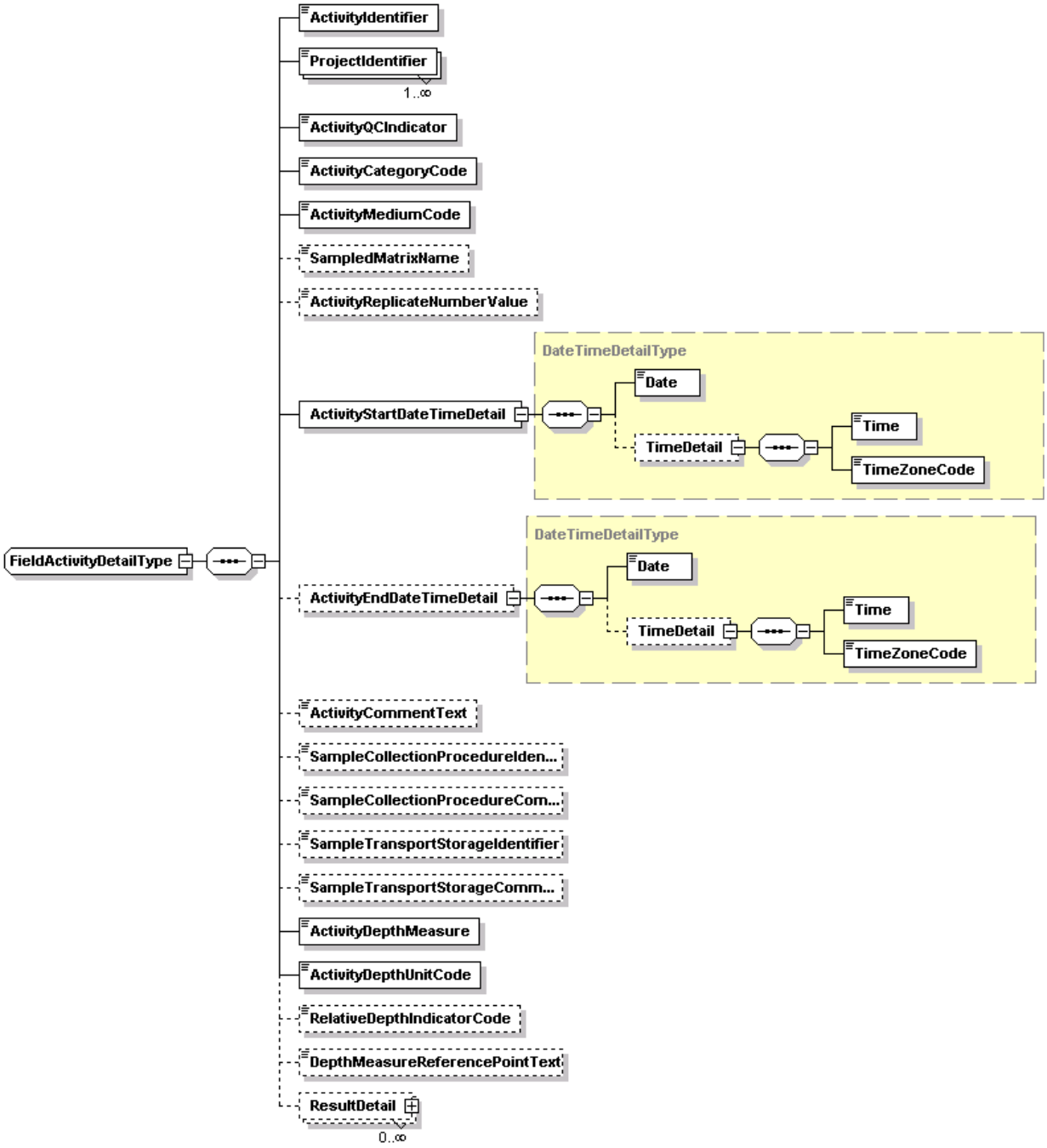


Exhibit 4-6 Result Detail

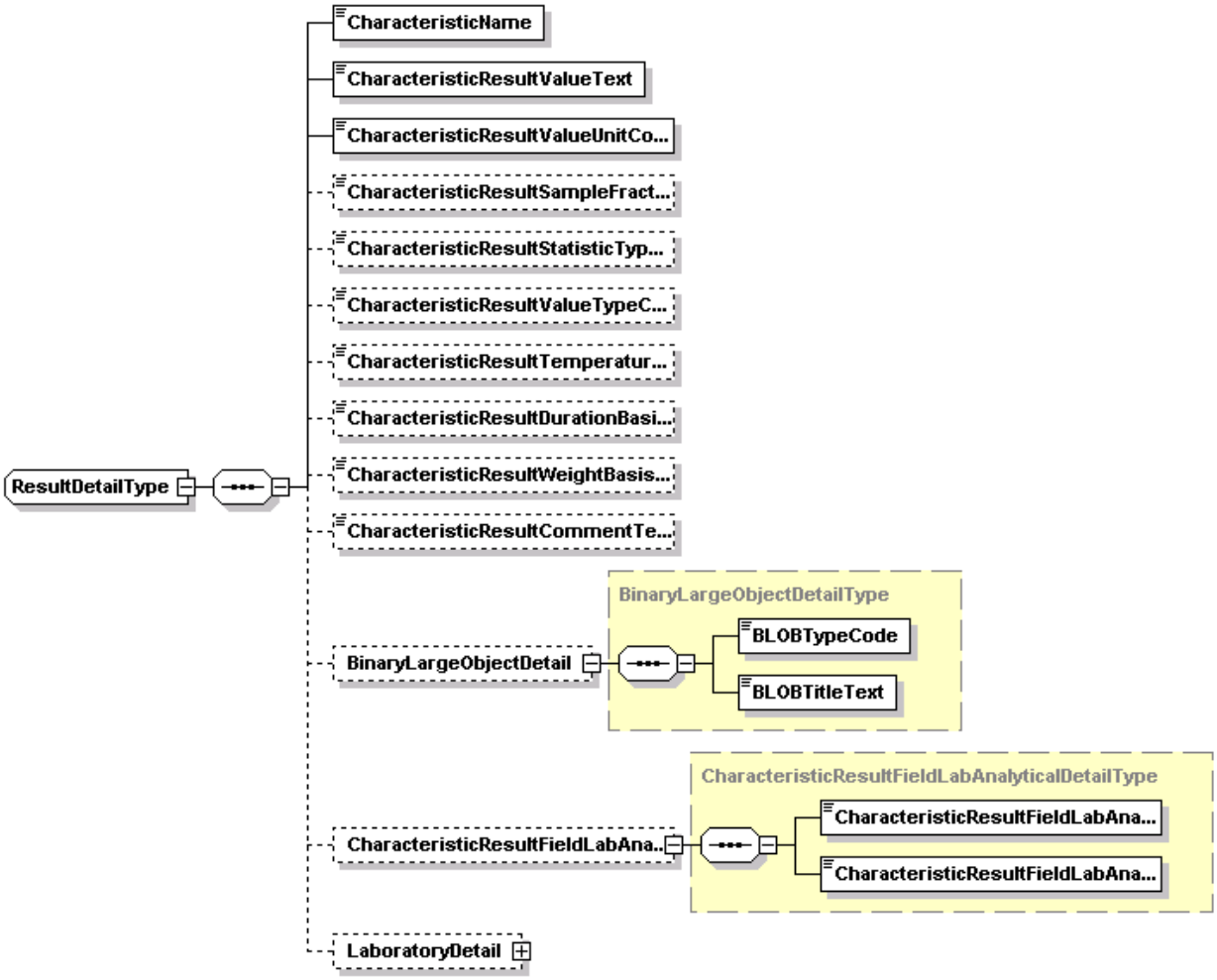


Exhibit 4-7 Laboratory Detail

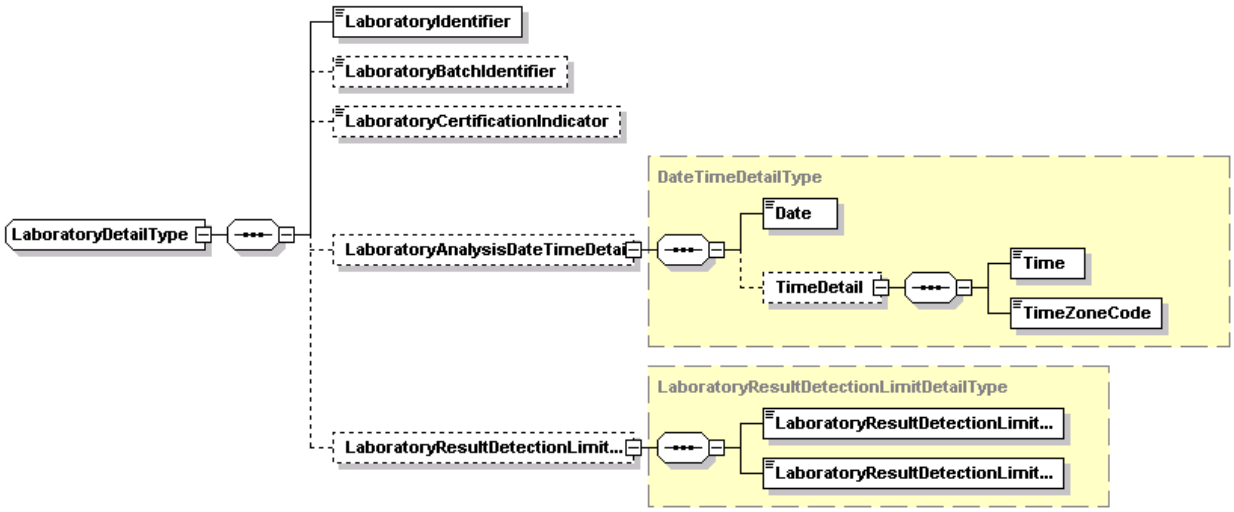
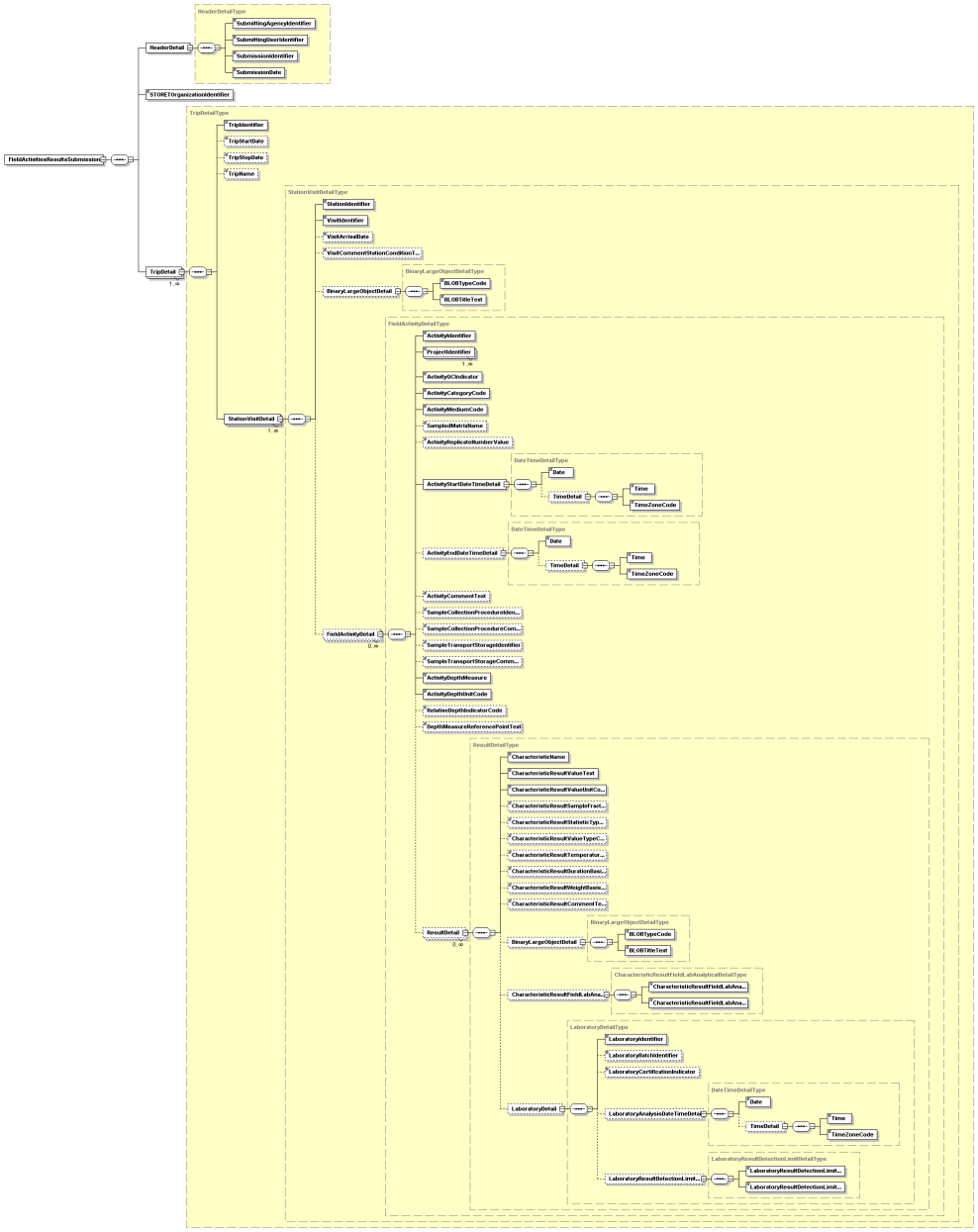


Exhibit 4-8 Field Activities Results Submission



5 Appendix B Example Complete XML File

The following is text from an example XML file that would be sent to STORET from a State. The file appears with spacing to provide a more clear view of the data. The spacing is not required or standard.

Exhibit 5-1 Sample Complete XML File

```
<?xml version="1.0" encoding="UTF-8"?>
<FieldActivitiesResultsSubmission xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="storet v6.1.xsd">
 <STORETOrganizationIdentifier>21FLEECO</STORETOrganizationIdentifier>
 <TripDetail>
 <TripIdentifier>21NJBP</TripIdentifier>
 <TripStartDate>2003-01-01</TripStartDate>
 <TripStopDate>2003-01-01</TripStopDate>
 <TripName>Weekly Sampling</TripName>
 <StationVisitDetail>
 <StationIdentifier>095L-3</StationIdentifier>
 <VisitIdentifier>12</VisitIdentifier>
 <VisitArrivalDate>2003-01-01</VisitArrivalDate>
 <VisitCommentStationConditionText>Sunny and dogs</VisitCommentStationConditionText>
 <BinaryLargeObjectDetail>
 <BLOBTypeCode>PDF</BLOBTypeCode>
 <BLOBTitleText>PictureofBeach52.PDF</BLOBTitleText>
 </BinaryLargeObjectDetail>
 <FieldActivityDetail>
 <ActivityIdentifier>62343B</ActivityIdentifier>
 <ProjectIdentifier>EPABEACH</ProjectIdentifier>
 <ProjectIdentifier>NJ012345</ProjectIdentifier>
<ActivityQCIndicator>Y</ActivityQCIndicator>
 <ActivityCategoryCode>Sample</ActivityCategoryCode>
 <ActivityMediumCode>Water</ActivityMediumCode>
 <SampledMatrixName>Bob's</SampledMatrixName>
 <ActivityReplicateNumberValue>476</ActivityReplicateNumberValue>
 <ActivityStartDateTimeDetail>
 <Date>2003-01-01</Date>
 <TimeDetail>
 <Time>10:30:00</Time>
 <TimeZoneCode>EDT</TimeZoneCode>
 </TimeDetail>
 </ActivityStartDateTimeDetail>
 <ActivityEndDateTimeDetail>
```

<Date>2003-01-16</Date>
<TimeDetail>
<Time>16:12:17</Time>
<TimeZoneCode>EDT</TimeZoneCode>
</TimeDetail>
</ActivityEndDateTimeDetail>
<ActivityCommentText>Windy</ActivityCommentText>
<SampleCollectionProcedureIdentifier>Standard</SampleCollectionProcedureIdentifier>
<SampleCollectionProcedureCommentText>See the New Jersey Department of Environmental Quality Assurance Program Plan</SampleCollectionProcedureCommentText>
<SampleTransportStorageIdentifier>JJ871</SampleTransportStorageIdentifier>
<SampleTransportStorageCommentText>No Comment</SampleTransportStorageCommentText>
<ActivityDepthMeasure>3</ActivityDepthMeasure>
<ActivityDepthUnitCode>ft</ActivityDepthUnitCode>
<RelativeDepthIndicatorCode>Bottom</RelativeDepthIndicatorCode>
<DepthMeasureReferencePointText>High surf</DepthMeasureReferencePointText>
<ResultDetail>
<CharacteristicName>Enterococcus</CharacteristicName>
<CharacteristicResultValueText>35</CharacteristicResultValueText>
<CharacteristicResultValueUnitCode>cfu/100ml</CharacteristicResultValueUnitCode>
<CharacteristicResultSampleFractionCode>Total</CharacteristicResultSampleFractionCode>
<CharacteristicResultStatisticTypeCode>Maximum</CharacteristicResultStatisticTypeCode>
<CharacteristicResultValueTypeCode>Actual</CharacteristicResultValueTypeCode>
<CharacteristicResultTemperatureBasisCode>25 Deg C</CharacteristicResultTemperatureBasisCode>
<CharacteristicResultDurationBasisCode>1 Day</CharacteristicResultDurationBasisCode>
<CharacteristicResultWeightBasisCode>Wet</CharacteristicResultWeightBasisCode>
<CharacteristicResultCommentText>Not quite wet, yet not quite dry</CharacteristicResultCommentText>
<BinaryLargeObjectDetail>
<BLOBTypeCode>JPG</BLOBTypeCode>
<BLOBTitleText>Sediment4.JPG</BLOBTitleText>
</BinaryLargeObjectDetail>
<CharacteristicResultFieldLabAnalyticalDetail>
<CharacteristicResultFieldLabAnalyticalSourceAcronym>DOH</CharacteristicResultFieldLabAnalyticalSourceAcronym>
<CharacteristicResultFieldLabAnalyticalProcedureIdentifier>87U23</CharacteristicResultFieldLabAnalyticalProcedureIdentifier>
</CharacteristicResultFieldLabAnalyticalDetail>
<LaboratoryDetail>
<LaboratoryIdentifier>CC8</LaboratoryIdentifier>
<LaboratoryBatchIdentifier>98UIXW2</LaboratoryBatchIdentifier>
<LaboratoryCertificationIndicator>Y</LaboratoryCertificationIndicator>
<LaboratoryAnalysisDateTimeDetail>
<Date>2003-01-01</Date>
<TimeDetail>

<Time>00:45:59</Time>
<TimeZoneCode>EDT</TimeZoneCode>
</TimeDetail>
</LaboratoryAnalysisDateTimeDetail>
<LaboratoryResultDetectionLimitDetail>
<LaboratoryResultDetectionLimitText>20</LaboratoryResultDetectionLimitText>
<LaboratoryResultDetectionLimitUnitCode>ppm</LaboratoryResultDetectionLimitUnitCode>
</LaboratoryResultDetectionLimitDetail>
</LaboratoryDetail>
</ResultDetail>
</FieldActivityDetail>
</StationVisitDetail>
</TripDetail>
</FieldActivitiesResultsSubmission>

6 Appendix C Example Minimum XML File

The following is text from an example XML file that would be sent to STORET from a State. The file appears with spacing to provide a more clear view of the data. The spacing is not required or standard.

Exhibit 6-1 Sample Minimum XML File

```
<?xml version="1.0" encoding="UTF-8"?>
<FieldActivitiesResultsSubmission xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="storet v6.1.xsd">
<STORETOrganizationIdentifier>21FLEECO</STORETOrganizationIdentifier>
 <TripDetail>
 <TripIdentifier>21ARIZ</TripIdentifier>
<StationVisitDetail>
 <StationIdentifier>095L-3</StationIdentifier>
 <VisitIdentifier>12</VisitIdentifier>
 <FieldActivityDetail>
 <ActivityIdentifier>62343B</ActivityIdentifier>
 <ProjectIdentifier>EPABEACH</ProjectIdentifier>
 <ProjectIdentifier>NJ012345</ProjectIdentifier>
 <ActivityQCIndicator>Y</ActivityQCIndicator>
 <ActivityCategoryCode>Sample</ActivityCategoryCode>
 <ActivityMediumCode>Water</ActivityMediumCode>
 <ActivityStartDateTimeDetail>
 <Date>2003-01-01</Date>
 </ActivityStartDateTimeDetail>
 <ActivityDepthMeasure>3</ActivityDepthMeasure>
 <ActivityDepthUnitCode>ft</ActivityDepthUnitCode>
 <ResultDetail>
 <CharacteristicName>Enteroccoccus</CharacteristicName>
 <CharacteristicResultValueText>35</CharacteristicResultValueText>
 <CharacteristicResultValueUnitCode>cfu/100ml</CharacteristicResultValueUnitCode>
 </ResultDetail>
 </FieldActivityDetail>
 </StationVisitDetail>
 </TripDetail>
</FieldActivitiesResultsSubmission>
```